EXPLORING THE HEART OF LOGISTICS

Deploying Expeditionary Medical Assets

Captain Robert E. Overstreet, USAF

While the mission of the Air Force Logistics Management Agency (AFLMA) is to enhance logistics efficiency and effectiveness, we have focused primarily on the flight-line side of logistics. A refreshing change came in early April 2003 when the Air Force Surgeon General requested that AFLMA study the establishment of central war reserve materiel (WRM) storage and deployment centers. He stated that the lighter equipment packages that make up the Expeditionary Medical Support (EMEDS) and aeromedical evacuation systems have created transportation challenges.[1]

The EMEDS system was built in 1999 to replace the large air-transportable hospital. This new system—a lightweight, rapidly deployable, modular medical capability—is flexible enough to respond to any scenario.[2] It follows a building-block approach to attain medical capability in theater. Much of the initial EMEDS medical capability is composed of care providers with backpacks, the Prevention and Aerospace Medicine Team, Mobile Field Surgical Team, and the Expeditionary Critical Care Team. The ten-man small portable expeditionary aeromedical rapid response (SPEARR) capability is completed by the addition of the SPEARR trailer, which contains one tent with equipment and supplies. The EMEDS basic brings with it 15 more persons, two shelters, supplies, and equipment. EMEDS +10 contains 31 persons, three more shelters, and ten inpatient beds. EMEDS +25 contains 30 persons, three more shelters and 15 inpatient beds. The EMEDS capability can continue to expand with additional ten-bed packages or specialty sets. Figure 1 depicts how this capability is built based on population at risk, the number of persons for which the Air Force provides medical care.

The EMEDS system unit type codes (UTC) are stored at and deployed from many different medical treatment facilities, both in the continental United States (CONUS) and overseas. Because of the large number of origins and different aerial ports of embarkation (APOE), the time phasing of the EMEDS and aeromedical evacuation UTCs during Operation Enduring Freedom and Operation Iraqi Freedom were problematic.

The objectives of this study were to quantify the problems experienced in the deployment of EMEDS and aeromedical evacuation UTCs, identify the root causes of those problems, evaluate possible solutions, and provide a recommended solution to the Air Force Surgeon General's Office.

We assumed that only the UTCs identified by the Air Force Medical Logistics Office (AFMLO) were candidates for consolidation, and we were concerned only with CONUS-based UTCs. This study made no attempt to validate or invalidate the EMEDS or aeromedical evacuation concepts.

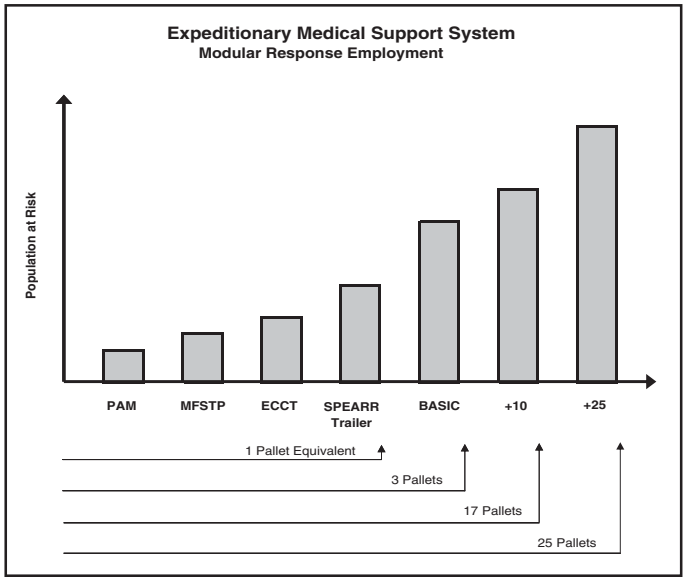

Figure 1. Expeditionary Medical Support System

Limited time and conceptual complexity were significant constraints for this study. AFLMA was asked to provide initial recommendations within 4 months of its first meeting with the AFMLO. The complexity of the EMEDS and aeromedical evacuation consolidation issue could have justified multiple studies easily.

The AFMLO scoped the project to an evaluation of 31 UTCs that deployed from the CONUS and identified two consolidation options. The first option was the establishment of a central hub located at KellyUSA, and the second option was the establishment of a dual hub with one located on the east coast and the other on the west coast. They also provided copies of the time-phased force deployment data (TPFDD) for Enduring Freedom and Iraqi Freedom.

This research sought to analyze the problem UTCs identified by the AFMLO and Air Mobility Command (AMC); gather and analyze TPFDD and aerial port data to investigate problems; and once problems were determined, review possible solutions to include central storage of medical WRM. We interviewed subject-matter experts, collected and analyzed cost data (storage, manpower, and contract), and evaluated the training and mission impact of possible solutions by interviewing and observing the participants in the process.

To that end, this study relied heavily on the qualitative research design. The qualitative paradigm is an inquiry process of understanding a problem or process by building a complex, holistic picture, conducting research in the natural setting, and expressing the results in narrative form.[3]

AFMLO provided the Enduring Freedom and Iraqi Freedom TPFDDs for analysis. We reviewed these and found what seemed to be capability being requested out of sequence. During our site visit at US Air Forces, US Central Command, we asked why capability was requested in such a manner. Functionals explained that the capability had been requested correctly but, if an item missed a ready-to-load date at the origin or an available-to-load date at the APOE, the original line in the TPFDD was deleted, and a new line with a new required delivery date was established. Because of deleted requirements in the TPFDD and new required delivery dates being established when a UTC missed a key transportation date, we determined that an evaluation of the transportation data received from AMC would not provide reliable information.

Interviews with functional representatives from civil engineering, communications, and security forces suggested that they experienced similar transportation problems. We identified the root causes of these problems as constrained airlift, intransit visibility issues, and a high number of deployment points of contact. Of these, only the number of points of contact can be addressed directly by the medical community.

Possible solutions include keeping these UTCs at their current locations and increasing deployment training, creating consolidation plans that can be accomplished just prior to deployment, or physically consolidating the UTCs. Because the first two solutions do not limit the number of deployment points of contact, this study evaluates different consolidation options based on benefits, costs, mission impact, and risks.

Consolidation has many intrinsic benefits. It reduces the number of deployment points of contact, generates economies of scale and scope, creates greater deferred procurement opportunities, improves quality control, and aggregates UTCs, which is critical when operating with limited aircraft availability.[4]

We calculated the one-time cost to transport the UTCs, warehouse rental costs, contractor salary differential, and military construction costs (Table 1). After much discussion about training, we found that the current training methodology can support the increase in the number of persons needing training at one of the three training facilities.

The following are two mission impacts of consolidation: EMEDS and aeromedical evacuation capability would be built, stored, maintained, reported, sourced, and deployed from one or just a few locations, and the fewer locations would ship that capability through fewer APOEs.

Consolidation creates large concentrations of CONUS EMEDS and aeromedical evacuation UTCs that could represent a significant loss of medical capability if made unavailable (for example, natural disaster, fire, and terrorist attack). However, two full EMEDS +25 sets are stored separately to support homeland defense, and a large portion of EMEDS capability is prepositioned overseas. There is a risk that consolidation alone will not provide the expected benefits if it becomes necessary to deploy small chunks of capability over an extended period of time. Deploying medical capability piecemeal could necessitate the use of a large number of APOEs.

This study concludes that EMEDS and aeromedical evacuation can be consolidated to better facilitate deployment operations, Air Force Manpower Standard 5530, *Medical Logistics,* should be revised, the effects of consolidation would have a minimal impact on the current training methodology, and readiness reporting should be assigned to the organization with the physical custody of the materiel.

This study recommends that the Air Force Medical Service consolidate EMEDS and aeromedical evacuation UTCs at KellyUSA, the Air Force Medical Service (AFMS) should request that Air Force Manpower Standard 5530 be recomputed for the management of medical WRM, and the Air Force Medical Service should task AFMLO to report readiness on EMEDS UTCs located at KellyUSA.

Consolidating all the 31 EMEDS and aeromedical evacuation UTCs at a single site increases the possibility of getting dedicated airlift, which helps ensure the medical capability is attained at the right place, at the right time. Even after deducting the cost of the warehouse, using the capacity already available at Kelly saves the AFMS $298K annually. While there still may be multiple APOEs, especially with smaller deployments, having one unit and one origin for all these UTCs makes the process of sourcing and tasking more straightforward. Another benefit is that reducing the number of points of contact enhances intransit visibility (ITV).

Consolidation of both EMEDS and aeromedical evacuation increases quality control of the UTCs by having a small cadre of personnel whose primary job is to manage these UTCs on a day-to-day basis. Each option may lend itself to other savings such as deferred procurement of shelf-life items. The focused efforts of a small number of personnel managing the buildup, storage, maintenance, readiness reporting, and deployment of this medical capability will lead to economies of scale and scope savings.

Ultimately, the question is whether consolidation will solve the deployment problems experienced by the AFMS during Enduring Freedom and Iraqi Freedom. While consolidation goes a long way to improve the management, sourcing, and ITV of aeromedical evacuation and EMEDS UTCs, it is not a deployment panacea. The Air Force still faces an airlift shortfall and, ultimately, the prioritization of cargo and the availability of airlift drive cargo movement.

	AE and EMEDS to AFMLO/FOW	AE and EMEDS to the East/West Coasts		AE to the East/West Coasts and EMEDS to AFMLO/FOW		AE to AMC Bases and EMEDS to AFMLO/FOW
Transportation	$170,000	$143,000		$170,000		$143,000
Construction	-	8,200,000	$10,200,000	3,300,000	4,200,000	-
Rental	$296,800	$458,000	$511,200	$469,550	$488,500	$296,800
Contractor Differential	-$595,063	$386,900	$746,149	-$284,741	-$277,741	-$322,685

Table 1. Option Costs

Notes

1. Lt Gen George Peach Taylor, Air Force Surgeon General, memorandum to Lt Gen Michael E. Zettler, Deputy Chief of Staff for Installations and Logistics, subject: Request for AFLMA Study of the Establishment of Central WRM Storage and Deployment Centers for Medical Assemblages, 4 Apr 03.
2. *Ibid*.
3. John W. Creswell, *Research Design: Qualitative & Quantitative Approaches*, Thousand Oaks, California: Sage Publications, 1994, 2.
4. Chairman of the Joint Chiefs of Staff Manual 3122.02B, *Joint Operation Planning and Execution System*, Vol III, 25 May 01, H-A-9.

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Using the Airfield Simulation Tool for Airfield Capacity-Capability Assessment

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Introduction

The Airfield Simulation Tool (AST) traditionally has been used for fleet-level analysis of transportation network flows.[1] For example, recent research completed by Captain Chris Randall at the Air Force Institute of Technology (AFIT) was used to assist the Air Mobility Command (AMC) Directorate of Logistics in assessing the impact of proposed operations on the health of the fleet. To improve this process, the directorate initiated the development of a mobility aircraft availability forecast simulation model to identify alternatives and associated impacts on aircraft availability, manpower, and cost. Randall's research identified and demonstrated how different base-support factors impact the availability of AMC aircraft. Simulation models were developed using the AST. However, the AST can be used for specific, wing-level analyses. This application is potentially quite useful for unit-level maintenance and operations managers in addressing capacity issues. The AST is a powerful tool for solving complex problems over a wide range of situations and is *user friendly* enough for many people to use effectively with a reasonable amount of training and practice.

This article presents the findings of an analysis performed by AFIT for a local logistics group commander more than a year ago. While the specifics of the analysis may no longer be timely (updates provided where relevant), this report represents the level and type of analysis that could be performed at any time by base personnel at units in similar situations. The purpose of this article is to describe the application of an available, relatively easy-to-use tool to assist logistics planners in performing analyses of airfield capacity and capability in order to achieve validation of new or existing missions and predict the ability of the base to process varying levels of workload.

With 24-hour tower operations and an abundance of available ramp space, Wright-Patterson AFB, Ohio, has opportunities for increased benefits from an optimized mix of airfield operations. In the spring of 2002, the 88th Logistics Group Commander wanted to explore the mix of existing operations with respect to proficiency training and contingency skills for his people. Without the right mix of operations, Wright-Patterson people could lose their warrior skill proficiency. This could be of special concern should Wright-Patterson be activated as an aerial port of embarkation (APOE) or be tasked to provide personnel or operational support for contingency and deployment operations. The 88th Log Group Commander solicited assistance from AFIT to determine his airfield's current capacity and capabilities in order to rationally seek the best potential increased workloads for the base. New business could provide 88th logistics personnel with valuable training and experience to ensure they are ready for APOE activation, while potentially alleviating congested aerial ports across the Air Force.

To determine Wright-Patterson's current capacity, AFIT employed the AST of the US Transportation Command's (TRANSCOM) aerial port of debarkation (APOD) model. Several modifications and adaptations were made to allow the model to be used for this project's intent. Though this report focuses on the capacity of Wright-Patterson's freight operations, preliminary research was conducted on ways to increase the proficiency of air traffic controllers. This research successfully demonstrated the efficacy of the AST for assessing airfield capacity and capability. In addition, the research identified areas where underutilized capacity could be exploited to provide additional training and proficiency opportunities. The information contained in the final report could be used to help determine what, if any, new business should be solicited for Wright-Patterson's airfield. Examples of such additional new business would include any Air Force or Department of Defense air cargo workload that could be transited through the Wright-Patterson port or any air traffic that could be routed through the Wright-Patterson airspace (to include instrument approaches or landings). Any proposed new business over that of the maximum revealed capacity could be simulated with the AST to assess further risks and probability of failure before proceeding.

Background

Wright-Patterson has undergone significant changes in operational mix since the departure of the LogAir hub in the 1990s. Tower traffic was decreased most recently with the departure of the 178th Fighter Squadron (Ohio Air National Guard F-16 unit) in April 2002. Wright-Patterson is home station to the 445th Airlift Wing (Air Force Reserve Command) and 47th Airlift Flight, comprising 18 C-141s and 6 C-21s.[2] Air traffic controllers currently experience low traffic counts, averaging only 100 per day,[3] and cargo freight personnel average only 2 air missions per week at 12 tons per mission.[4] Because of this limited peacetime traffic, the 88th Log Group Commander is concerned about personnel staying proficient in their warrior skills.[5] This concern is heightened further because of Wright-Patterson's role as an alternate APOE.

The intent of the research was to achieve two related objectives: first, perform a capacity analysis for the airfield and, second, evaluate the use of the AST as a tool for performing analyses of this type. This research comprised the first stage of a longer process to improve the efficiency, utility, and proficiency

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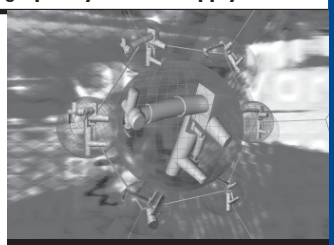
A part grouping system, however, effectively leverages a supply chain by arranging the production of individual items into groups that are based on common manufacturing processes.

Part Grouping

Angioplasty for the Supply Chain

Hey, *loggie* warfighter, your aged weapon systems are full of *tired iron*, you have diminishing manufacturing sources for mission critical spare parts, your industrial base is getting colder, and lead times are getting longer each day. Logistically, you have hardening of the arteries.

Agile Combat Support



Colonel Michael C. Yusi, USAF

The Editorial Advisory Board selected "Part Grouping"—written by Colonel Michael C. Yusi, USAF, Vol XXVII, No 1—as the most significant article to appear in the *Air Force Journal of Logistics* in 2003.

The Japanese were not the first to ignore the importance and vulnerability of logistics.

Oil Logistics

In the Pacific War

Lieutenant Colonel
Patrick H. Donovan, USAF

As long ago as 1187, history shows that logistics played a key part in the Muslim's victory over the Crusaders at the Battle of Hittin. The Muslim commander Saladin captured the only water source on the battlefield and denied its use to the Crusaders.

The Editorial Advisory Board selected "Oil Logistics in the Pacific War"—written by Lieutenant Colonel Patrick H. Donovan, USAF—as the most significant article to appear in Vol XXVIII, No 1 of the *Air Force Journal of Logistics*.

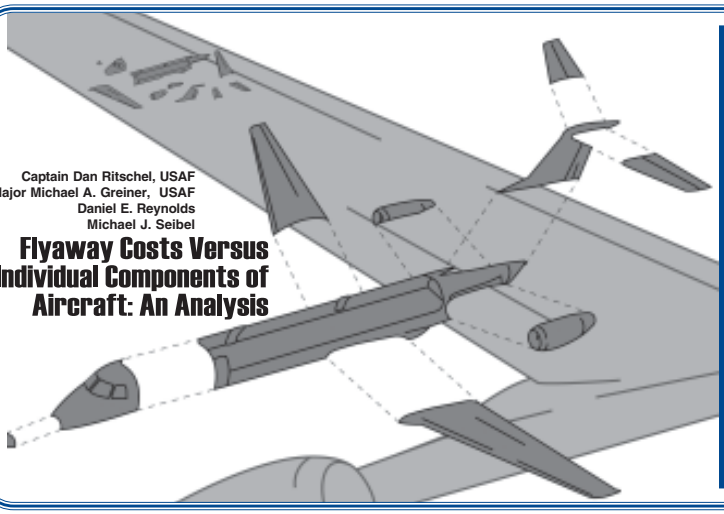
Lieutenant Colonel Joseph E. Diana, USAF

Improving Bare-Base Agile Combat Support

A Comparative Analysis Between Land Basing and Afloat Prepositioning of Bare-Base Support Equipment

To improve Air Force agility in establishing bare-base operations, RAND and the Air Force Logistics Management Agency analyzed current conditions separately and recommended potential solutions.

The Editorial Advisory Board selected "Improving Bare-Base Agile Combat Support: A Comparative Analysis Between Land Basing and Afloat Prepostioning of Bare-Base Support Equipment"—written by Lieutenant Colonel Joseph E. Diana, USAF—as the most significant article to appear in Vol XXVIII, No 2 of the *Air Force Journal of Logistics*.



Captain Dan Ritschel, USAF
Major Michael A. Greiner, USAF
Daniel E. Reynolds
Michael J. Seibel

Flyaway Costs Versus Individual Components of Aircraft: An Analysis

The staff of the *Air Force Journal of Logistics* selected "Flyaway Costs Versus Individual Components of Aircraft: An Analysis"—written by Captain Dan Ritschel, USAF; Major Michael A. Greiner, USAF; Daniel E. Reynolds, and Michael J. Seibel, Vol XXVII, No 4—as the best article written by a junior officer to appear in the *Air Force Journal of Logistics* in 2003.